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Author(s): Carr, Alan Brady
Tchakerian, Catarina Louise

Intended for: Review and approval for LA-UR for Alan and Catarina's presentation in Las Vegas, NV in March.

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Knowing Better Experts, the Public, and Above-Ground Nuclear Testing in Nevada

Alan Carr & Catarina Tchakerian

2/27/2023

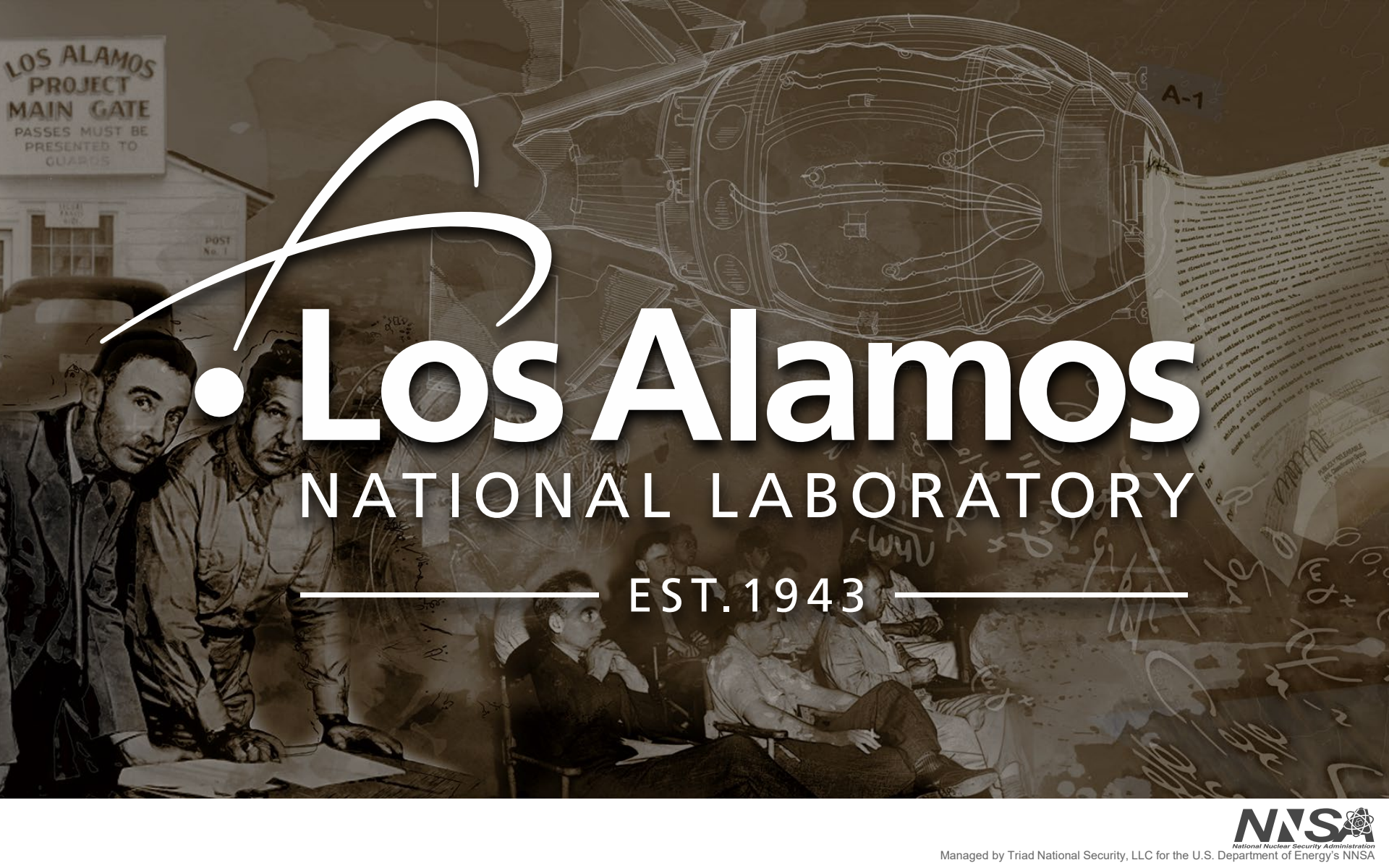
Abstract

- Review and approval for LA-UR for Alan and Catarina's presentation in Las Vegas, NV in March.

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Knowing Better

Experts, the Public, and Above-Ground Nuclear Testing in Nevada



Catarina Tchakerian

Graduate Student
Northeastern University

March 8, 2023

Presentation Overview



March 8, 2023

Las Vegas, NV



- Introduction to Topic
- Downwinders' Narrative
- Rad-Safe in the '50s and '60s
- Evidence Against Downwinders' Narrative
- Evidence of Government Errors
- RECA and its Legacy
- Conclusions



Introduction to Topic

The Experts

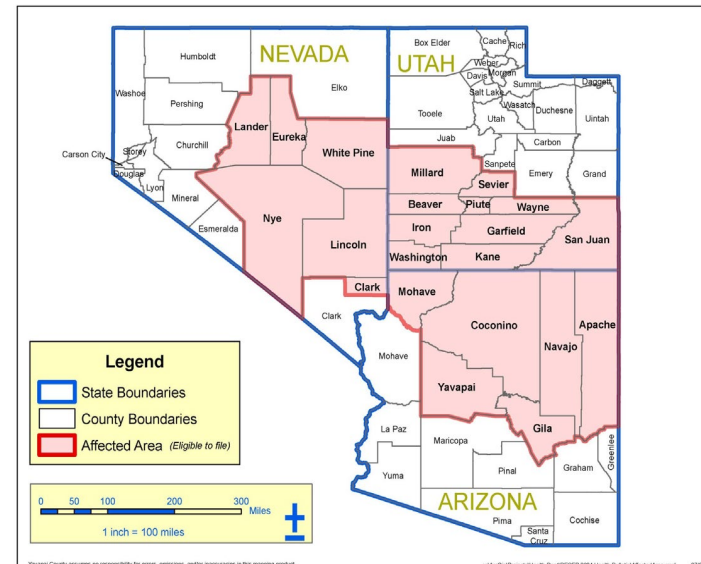
- The Nevada Proving Ground was the location of domestic nuclear testing
- It fulfilled a multitude of high-priority interests
 - Ideal location for laboratory access
 - Invaluable data source for scientists and engineers
 - Provided an arena to study and adapt military tactics
 - Supplied information about radiation safety (rad-safe)



Map of Nevada and Nevada Test and Training Range (map) from "About the NNSS," Nevada National Security Site NNSS, Department of Energy's National Nuclear Security Administration, accessed February 1, 2023, <https://www.nnss.gov/pages/about.html>.



- Involuntary participants in testing
 - Psychological and physical effects
 - Creation of a deeply pessimistic belief system surrounding tests
 - Mobilized to petition for compensation

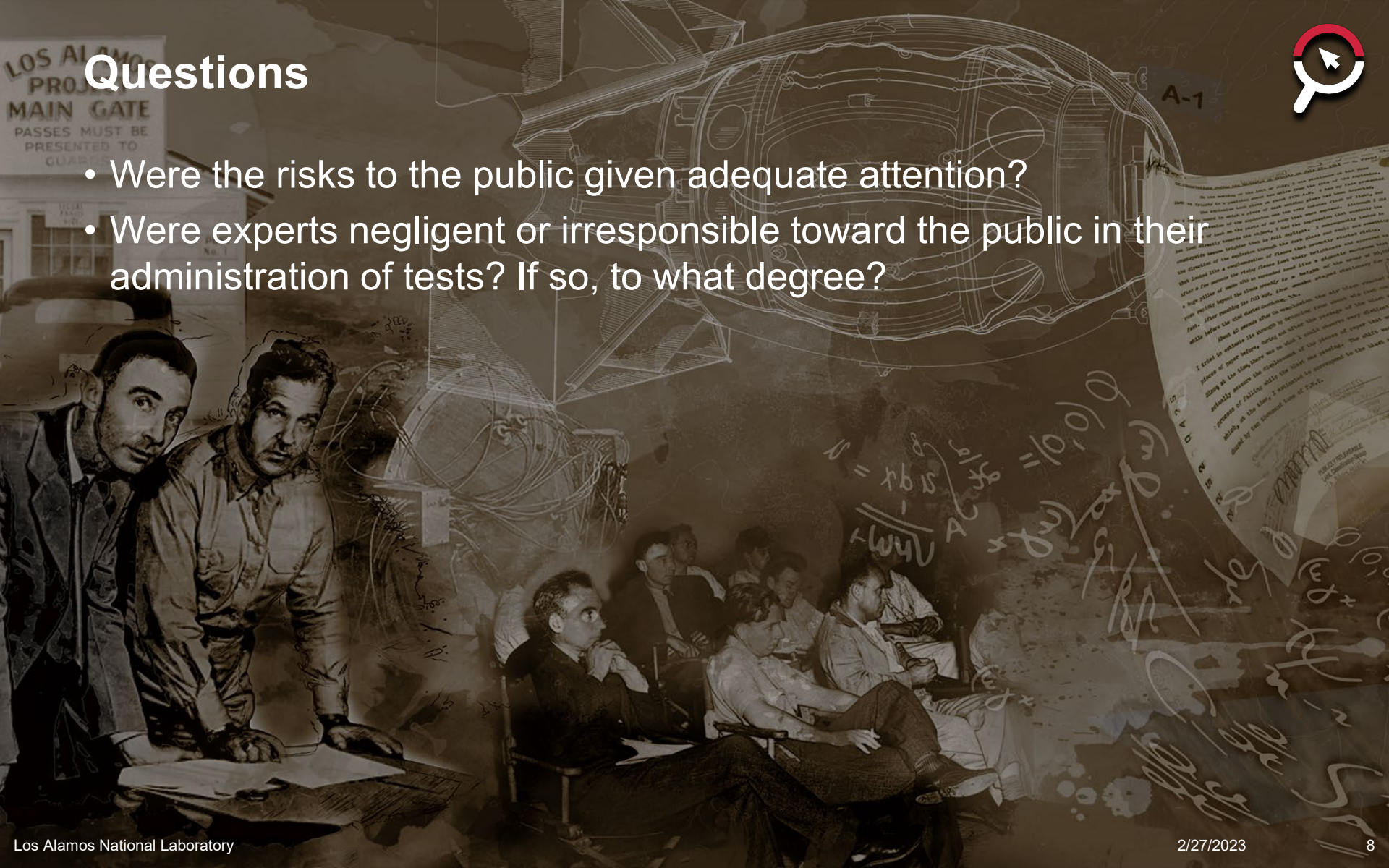


Downwinders® covered counties in Arizona, Nevada and Utah (map) from "Downwinders®, Downwinders Claim Forms, Downwinders Maps and Covered Cancers, Claims," Downwinders® Claims, Downwinders Claims, 2019, <https://downwinders.info/downwinders-maps/>.



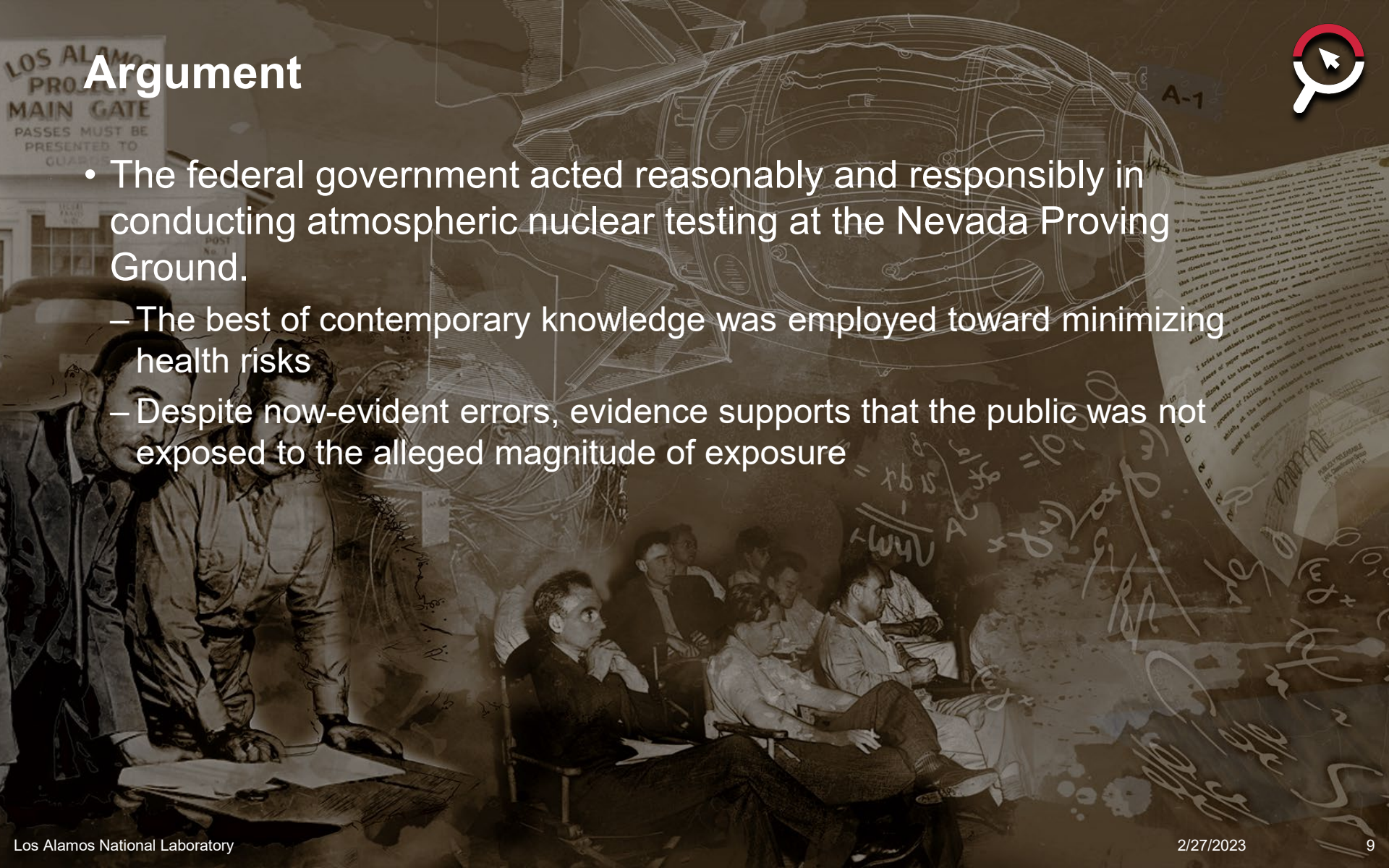
Questions

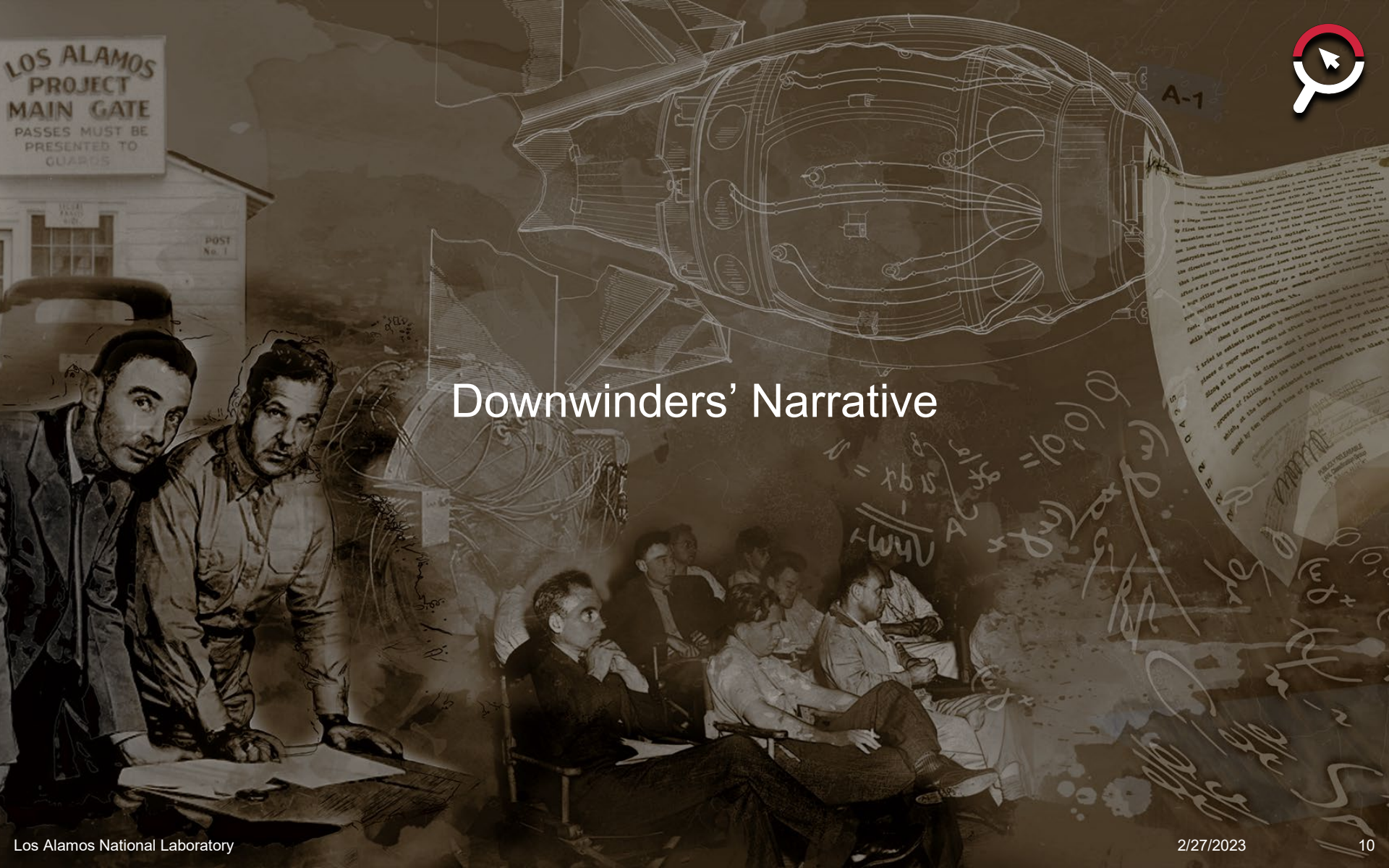
- Were the risks to the public given adequate attention?
- Were experts negligent or irresponsible toward the public in their administration of tests? If so, to what degree?



Argument

- The federal government acted reasonably and responsibly in conducting atmospheric nuclear testing at the Nevada Proving Ground.
 - The best of contemporary knowledge was employed toward minimizing health risks
 - Despite now-evident errors, evidence supports that the public was not exposed to the alleged magnitude of exposure





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Downwinders' Narrative



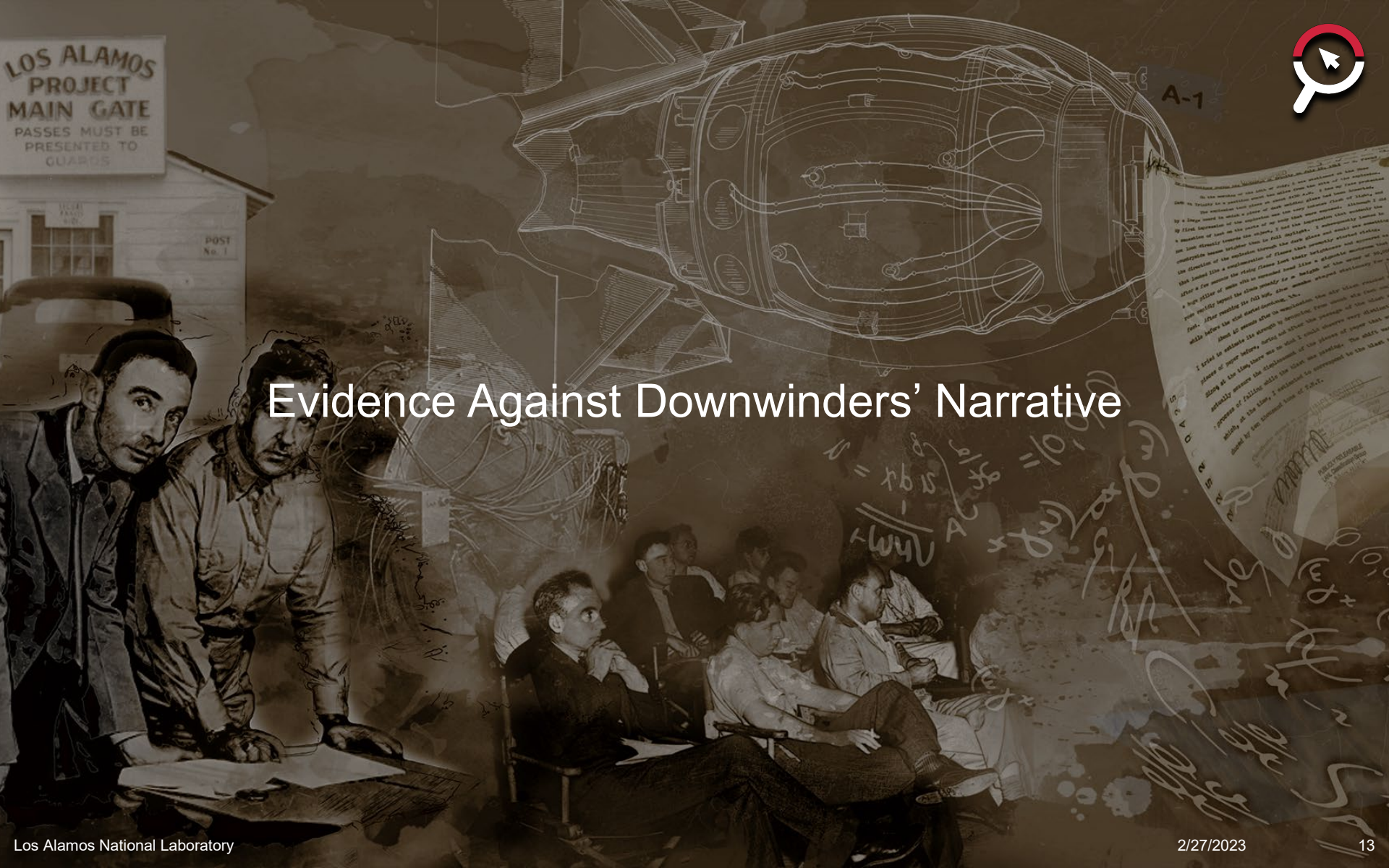
Fission Products → Health Problems

- Allegations of cancer, birth complications, etc.
 - *Justice Downwind: America's Atomic Testing Program in the 1950s*
 - *American Ground Zero: The Secret Nuclear War*
- However, Downwinders' claims about fallout-induced health issues:
 - Demonstrate an incomplete understanding of contemporary rad-safe
 - Overestimate the strength and intensity of exposure

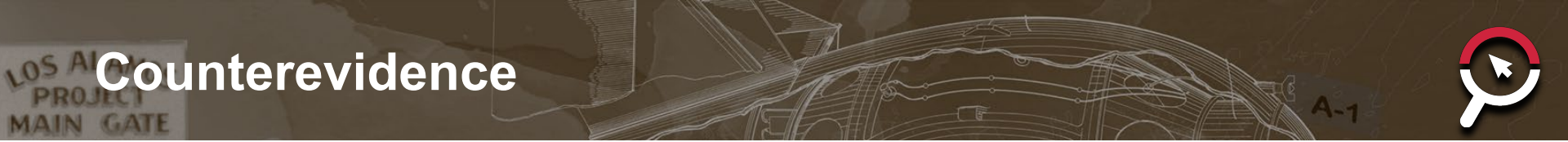
Rad-Safe in the 1950s and 1960s



- Standards were based on limited available precedent
 - Medical procedures (x-rays)
 - Miners and Radium Girls
- Prevalence of the **Acceptable Tolerance Threshold** theory
 - Compare acceptable dose for onsite vs. offsite participants
- Monitoring efforts
 - Multiple agencies involved
 - Tracked fallout and weather conditions
- By the 1960s, rad-safe evolved toward **viewing radiation exposure as cumulative**

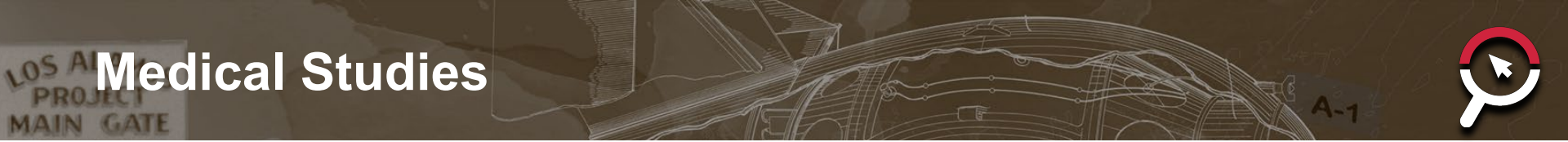


Evidence Against Downwinders' Narrative



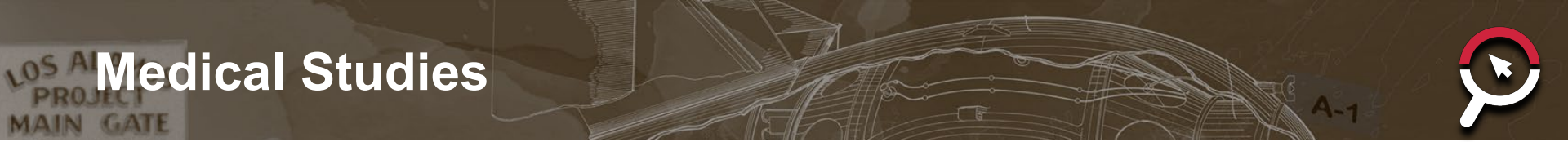
Counterevidence

- Evidence challenging allegations of individual instances of radiation-caused cancer, birth defects
- Evidence pointing to inadequate exposure for alleged ill



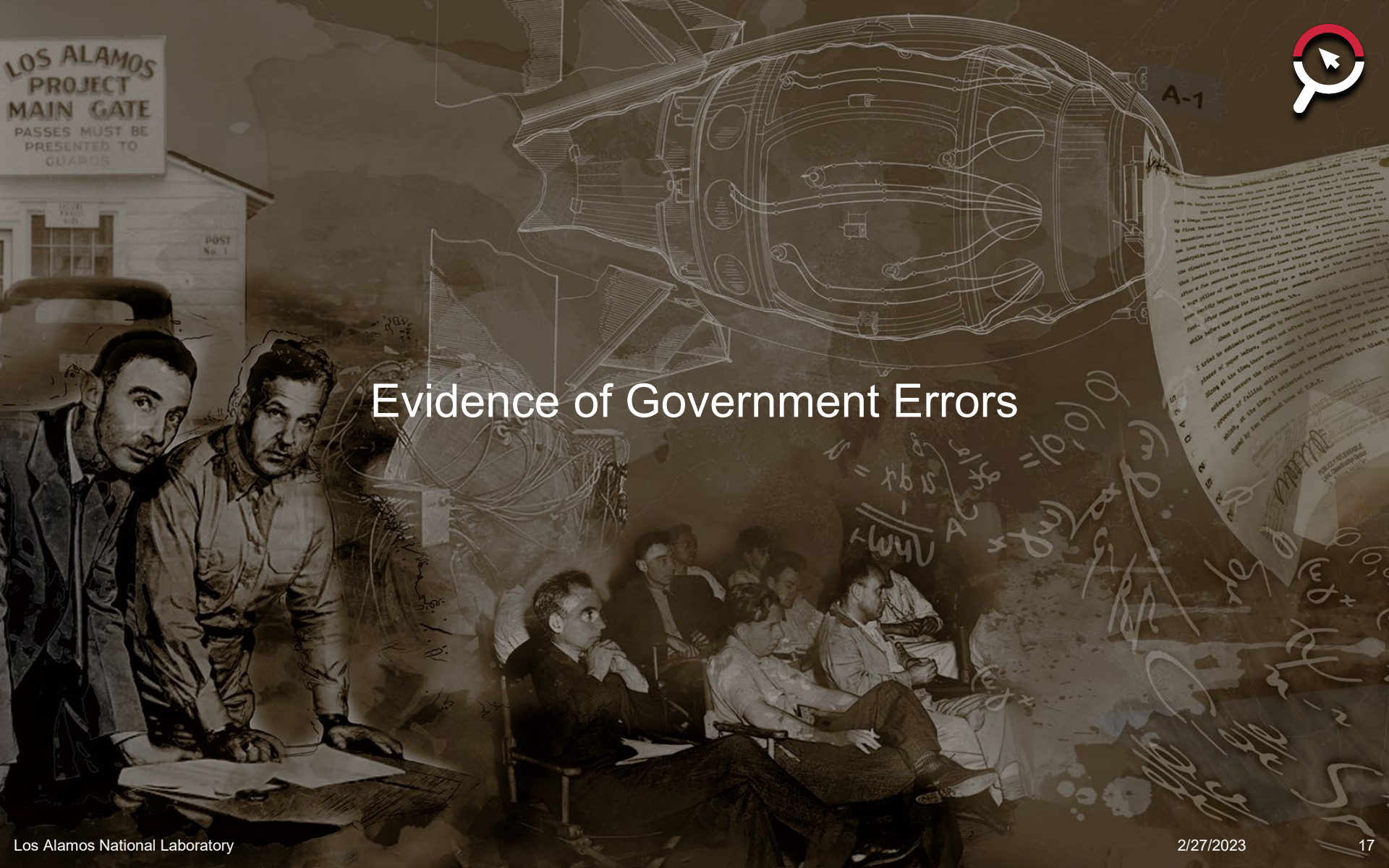
Medical Studies

- Fallout follows upper-atmospheric wind currents, rather than lower-atmospheric conditions.¹
- Consideration of the negative impacts of fallout has been affected by misunderstandings about its strength and intensity.²



Medical Studies

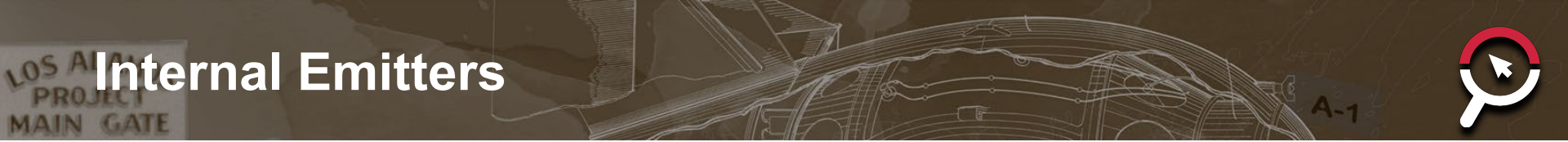
- Results of studies point to leukemia and thyroid cancer as the “primary cancer risks” of radiation exposure.³
 - Health effects of fallout exposure “can, for the most part, be described as small excesses over baseline rates” for these cancers.⁴
 - Risk models point to an **excess of 12% of cases** of thyroid cancer (49,000 extra cases over the 400,000 cases already expected) due to Nevada testing.⁵



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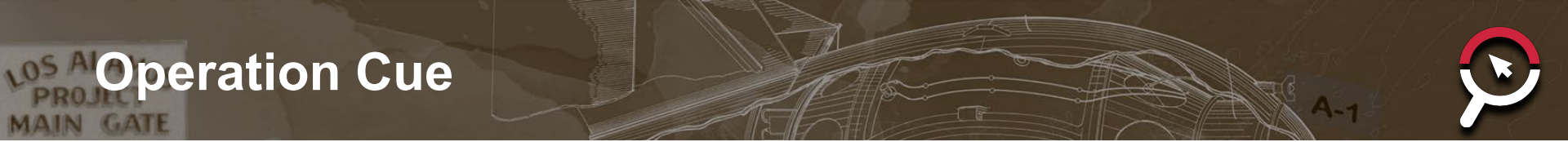
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Evidence of Government Errors



Internal Emitters

- Prioritization of gamma rays over alpha rays
 - Alpha rays considered relatively insignificant for testing purposes
 - Insufficient tools and methods to measure the half-lives of strontium, iodine



Operation Cue

- Part of Operation Teapot
- Found canned, jarred, packaged, open, and frozen foods to be irradiated following the test shot
- Yet, Atomic Energy Commission (AEC) publications continued to instruct Americans in grossly ineffective food decontamination methods
 - Internal emitters can be absorbed through the skin, but the primary form of exposure is through consumption.



"Welfare photos of Operation Cue Atomic Explosion," (photograph), 1951–1961, *Digital Commonwealth*, Federal Civil Defense Administration, Region 1, 1951–1958, accessed January 15, 2023, <https://ark.digitalcommonwealth.org/ark:/50959/h128s205n>.



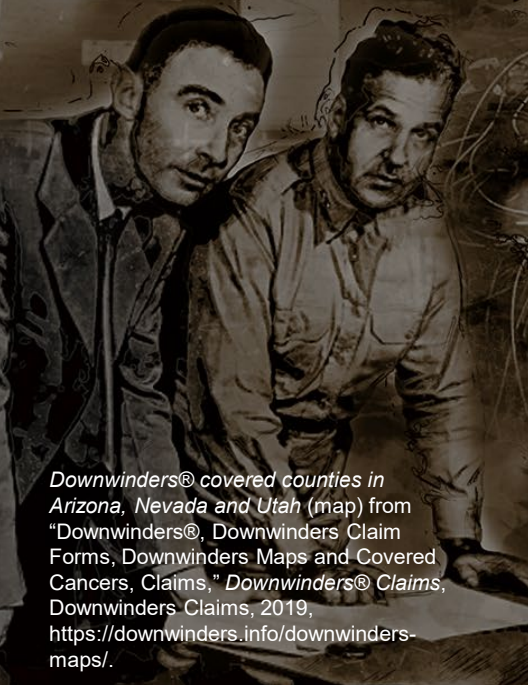
RECA and its Legacy

The Radiation Exposure Compensation Act (RECA)

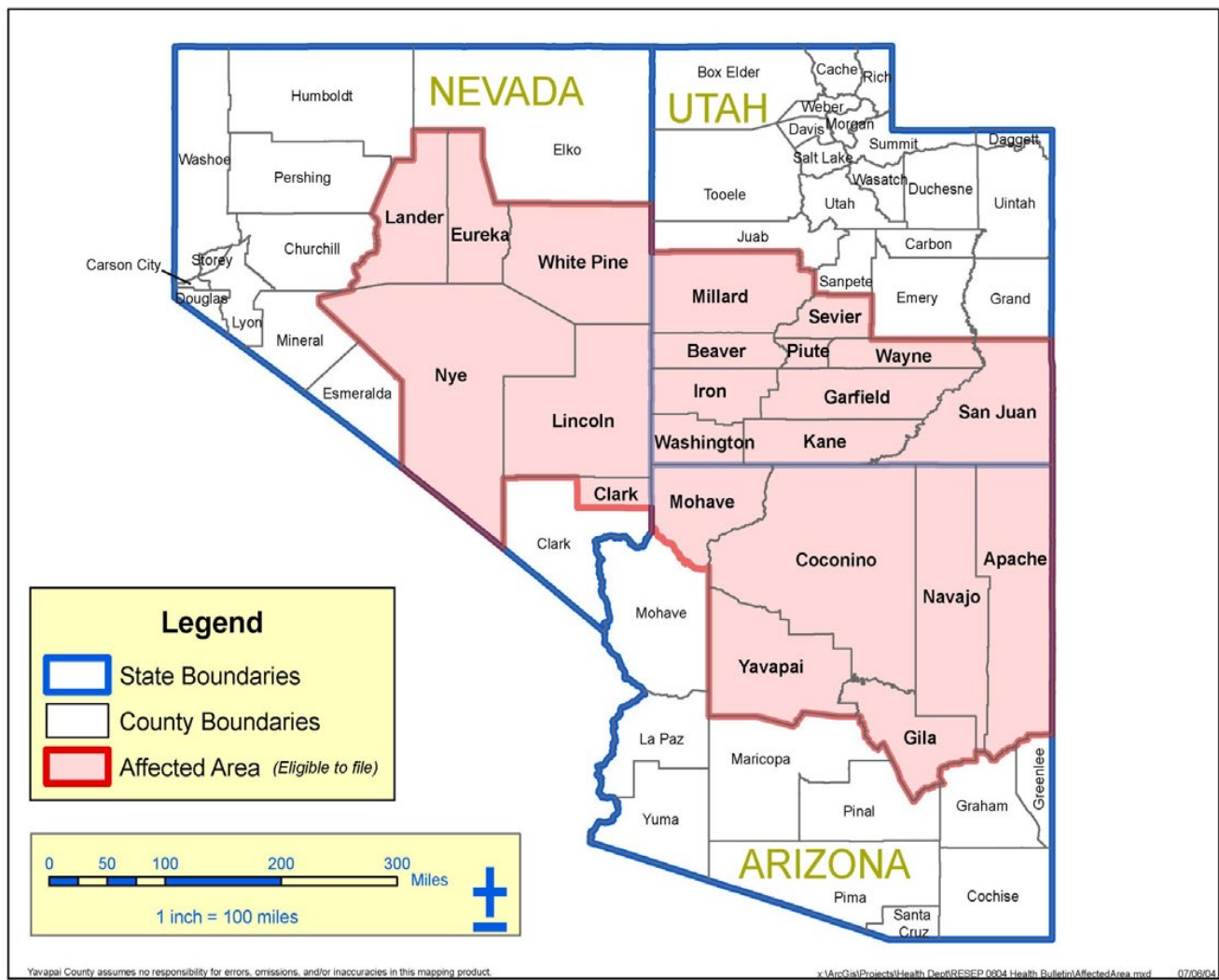


- Passed in 1990 (recently extended)
- Provides “**one-time benefit payments to persons who may have developed cancer or other specified diseases after being exposed to radiation from atomic weapons testing** or uranium mining, milling, or transporting.”⁶
- Compensation based on proof of disease + residency requirements

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Downwinders® covered counties in
Arizona, Nevada and Utah (map) from
"Downwinders®, Downwinders Claim
Forms, Downwinders Maps and Covered
Cancers, Claims," *Downwinders® Claims*,
Downwinders Claims, 2019,
[https://downwinders.info/downwinders-
maps/](https://downwinders.info/downwinders-maps/).



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Specified Cancers for Eligibility as Onsite Participants and Downwinders and Table 3. Downwinder Eligibility Areas (tables) from Scott D. Szymendera, "The Radiation Exposure Compensation Act (RECA): Compensation Related to Exposure to Radiation from Atomic Weapons Testing and Uranium Mining," R43956 (Congressional Research Service, July 14, 2022), <https://crsreports.congress.gov/product/pdf/R/R43956>, 6.

Table 2. Specified Cancers for Eligibility as Onsite Participants and Downwinders

(all cancers must be primary cancers)

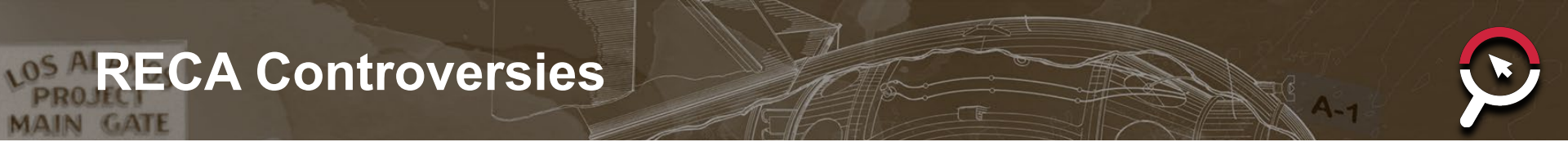
<i>Onset of the disease was at least two years after first exposure to fallout</i>		
Leukemia (other than chronic lymphocytic leukemia) if exposure to fallout was after age 20		
<i>Onset of the disease was at least five years after first exposure to fallout</i>		
Multiple Myeloma	Lymphomas (other than Hodgkin's disease)	Bile Duct Cancer
Brain Cancer	Breast Cancer (male or female)	Colon Cancer
Esophageal Cancer	Gall Bladder Cancer	Liver Cancer (except if cirrhosis or hepatitis B is indicated)
Ovarian Cancer	Pancreatic Cancer	Pharynx Cancer
Salivary Gland Cancer	Small Intestine Cancer	Stomach Cancer
Thyroid Cancer	Urinary Bladder Cancer	Lung Cancer

Source: 42 U.S.C. §2210 note.

Table 3. Downwinder Eligibility Areas

Arizona	Nevada	Utah
Apache County	Eureka County	Beaver County
Coconino County	Lander County	Garfield County
Gila County	Lincoln County	Iron County
Navajo County	Nye County	Kane County
Yavapai County	White Pine County	Millard County
Mohave County north of the Grand Canyon	Clark County townships 13 through 16 at ranges 63 through 71	Paiute County
		San Juan County
		Sevier County
		Washington County
		Wayne County

Source: 42 U.S.C. §2210 note.



RECA Controversies

- Pays greater sums to counties that received relatively less exposure than less-rewarded or excluded counties
- Subject to political biases



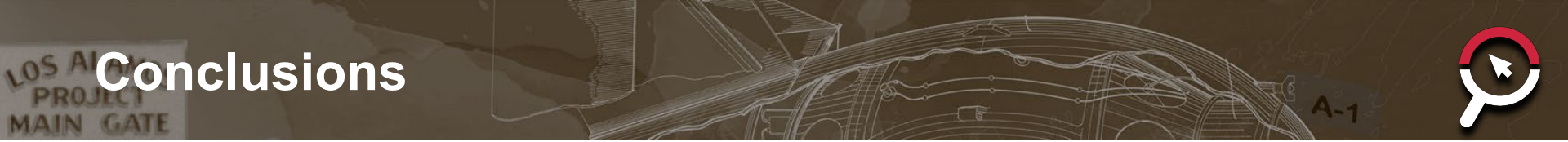
Public Perception and Fear of Radiation

- Nuclear power remains shrouded behind scientific jargon and political jockeying
 - Fear and misinformation stoked by non-expert publications and productions
 - Misconceptions upheld by flawed legislation and inaccessible publications

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Conclusions

Evidence points to experts' awareness of and efficacy in protecting the public from extreme fallout exposure, even given contemporary miscalculations and the unfortunate (lower) prioritization of rad-safe.

The agents of the federal government acted reasonably and responsibly in conducting atmospheric nuclear testing at the Nevada Proving Ground, evidenced by their attention to public health risks, and despite now-evident miscalculations and errors.

Footnotes:

1. Steven L. Simon, Andre Bouville, and Charles E. Land, “Fallout from Nuclear Weapons Tests and Cancer Risks,” *American Scientist* 94, no. 1 (January-February 2006): 48.
2. Steven L. Simon and Andre Bouville, “Health effects of nuclear weapons testing,” *The Lancet* 386, no. 9992 (August 1, 2015): 407.
3. Simon et. al., “Fallout from Nuclear Weapons,” 57.
4. Simon and Bouville, “Health effects of nuclear weapons testing,” 408.
5. Ibid.
6. Scott D. Syzmendera, “The Radiation Exposure Compensation Act (RECA): Compensation Related to Exposure to Radiation from Atomic Weapons Testing and Uranium Mining,” R43956 (Congressional Research Service, July 14, 2022), <https://crsreports.congress.gov/product/pdf/R/R43956>, summary.